calculate the desired flow through at least one of the flow lines if the actual ratio is unequal to the desired ratio, and

provide a signal indicative of the desired flow to at least one of the valves~~, wherein the desired flow is substantially equal to $K_p(\alpha - \alpha_{sp}) + K_i\int(\alpha - \alpha_{sp})dt$, wherein K_p is a proportional gain, K_i is an integral gain, α is the actual flow ratio, and α_{sp} is the desired flow ratio~~.

2. (Original) A system according to claim 1, wherein the flow meters are thermal-based.

3. (Currently amended) A system according to claim 1, wherein:

the secondary flow lines comprise first and second flow lines; and

the controller is programmed to,

provide a signal to the valve of the first flow line indicative of a first desired flow,

calculate a second desired flow if the actual ratio is unequal to the desired ratio, and

provide a signal to the valve of the second flow line indicative of the second desired flow.

4. (Original) A system according to claim 3, wherein the first desired flow causes the valve of the first line to fully open.

5. (Original) A system according to claim 3, wherein the ratio of flow is equal to the flow through the second flow line divided by the flow through the first flow line.

6. (Original) A system according to claim 5, wherein an allowable range for the

desired ratio of flow is between about 1 and about 10.

7. (Currently amended) A system according to claim 1, wherein:

the secondary flow lines comprise first, second and third flow lines;

the user interface is adapted to receive a desired ratio of flow for the second and the first flow lines, and a desired ratio of flow for the third and the first flow lines; and

the controller is programmed to,

provide a signal to the first valve indicative of a first desired flow through the first flow line,

receive the desired ratios of flow through the user interface,

receive the signals indicative of measured flow from the flow meters,

calculate an actual ratio of flow for the second and the first flow lines based upon the measured flows through the second and the first flow lines,

calculate a second desired flow if the actual ratio for the second and the first flow lines is unequal to the desired ratio for the second and the first flow lines,

provide a signal to the valve of the second flow line indicative of the second desired flow, wherein the second desired flow is substantially equal to $K_p(\alpha_2 - \alpha_{2sp}) + K_i\int(\alpha_2 - \alpha_{2sp})dt$, wherein K_p is a proportional gain, K_i is an integral gain, α_2 is the actual flow ratio for the second and the first flow lines, and α_{2sp} is the desired flow ratio for the second and the first flow lines,

calculate an actual ratio of flow for the third and the first flow lines based upon the measured flows through the third and the first flow lines,

calculate a third desired flow if the actual ratio for the third and the first flow lines is unequal to the desired ratio for the third and the first flow lines, and

provide a signal to the valve of the third flow line indicative of the third desired flow, wherein the third desired flow is substantially equal to $K_p(\alpha_3 - \alpha_{3sp}) + K_i\int(\alpha_3 - \alpha_{3sp})dt$, wherein K_p is a proportional gain, K_i is an integral gain, α_3 is the actual flow ratio for the third and the first flow lines, and α_{3sp} is the desired flow ratio for the third and the first flow lines.

8. (Currently amended) A system according to claim 7, wherein the first desired flow causes the valve of the first flow line to fully open.

9. (Original) A system according to claim 7, wherein the first ratio of flow is equal to the flow through the second flow line divided by the flow through the first flow line, and the second ratio of flow is equal to the flow through the third flow line divided by the flow through the first flow line.

10. (Original) A system according to claim 9, wherein an allowable range for each desired ratio of flow is between about 1 and about 10.

11. (Canceled)

12. (Currently amended) A system according to claim 1, further comprising a pressure sensor measuring pressure in one of (a) the inlet and the (b) secondary flow lines, and connected to the controller to provide the pressure measurement to the controller.

13. (Original) A system according to claim 12, wherein the pressure sensor measures pressure in the inlet.

14. (Canceled)

15. (Canceled)

16. (Currently amended) A method ~~for~~ of dividing a single mass flow into two or more secondary mass flows ~~having of desired of desired ratios~~in accordance with a preselected ratio, comprising:

A) receiving a setting of the desired preselected ratio of mass flow through the secondary flow lines;

B) receiving ~~a~~the single mass flow into an inlet and dividing the single mass flow into at least two secondary flow lines connected to the inlet, ~~wherein the inlet is free of any flow meters for providing a measurement of flow through the inlet~~;

~~B)~~C) measuring mass flow through each secondary flow line;

~~C) receiving at least one desired ratio of mass flow;~~

D) calculating an actual ratio of mass flow through the secondary flow lines based upon the measured flows, wherein said calculation is made without reference to ~~a measured~~ the total ~~the single~~ mass flow through the inlet, nor the sum total of the mass flows through the secondary flow lines;

E) calculating a desired flow through at least one of the secondary flow lines if the actual ratio does not equal the desired ratio~~, wherein the desired flow is substantially equal to $K_p(\alpha - \alpha_{sp}) + K_i\int(\alpha - \alpha_{sp})dt$, wherein K_p is a proportional gain, K_i is an integral gain, α is the actual flow ratio, and α_{sp} is the desired flow ratio~~; and

F) regulating the flow line to the desired flow through the at least one of the secondary flow lines.

17. (Original) A method according to claim 16, wherein:

the single mass flow is divided into first and second flow lines;

the first flow line is regulated to a first desired flow;

a second desired flow is calculated using the desired ratio and the first desired flow if the actual ratio is unequal to the desired ratio; and

the second flow line is regulated to the second desired flow.

18. (Currently amended) A method according to claim 17, wherein the first desired flow causes the first flow line to be fully open.

19. (Original) A method according to claim 17, wherein the ratio of flow is equal to the flow through the second flow line divided by the flow through the first flow line.

20. (Original) A method according to claim 16, wherein an allowable range for the desired ratio of flow is between about 1 and about 10.

21. (Previously presented)A method according to claim 16, wherein:

the single mass flow is divided into first, second and third flow lines;

first and second desired ratios of mass flow are received;

the first flow line is regulated to a first desired flow;

a second desired flow is calculated using the first desired ratio and the first desired flow if the actual ratio of the first and the second flow lines is unequal to the desired first ratio, wherein the second desired flow is substantially equal to $K_p(\alpha_2 - \alpha_{2sp}) + K_i\int(\alpha_2 - \alpha_{2sp})dt$, wherein K_p is a proportional gain, K_i is an integral gain, α_2 is the actual flow ratio for the second and the first flow lines, and α_{2sp} is the desired flow ratio for the second and the first flow lines;

the second flow line is regulated to the second desired flow;

a third desired flow is calculated using the second desired ratio and the first desired flow if the actual ratio of the first and the third flow lines is unequal to the desired second ratio, wherein the third desired flow is substantially equal to $K_p(\alpha_3 - \alpha_{3sp}) + K_i\int(\alpha_3 - \alpha_{3sp})dt$, wherein K_p is a proportional gain, K_i is an integral gain, α_3 is the actual flow ratio for the third and the first flow lines, and α_{3sp} is the desired flow ratio for the third and the first flow lines; and

the third flow line is regulated to the third desired flow.

22. (Currently amended) A method according to claim 21, wherein the first desired flow causes the first flow line to be fully open.

23. (Original) A method according to claim 21, wherein the ratios of flow of the first and the second flow lines are equal to the flow through the second flow line divided by the flow through the first flow line, and the ratios of flow of the first and the third flow lines are equal to the flow through the third flow line divided by the flow through the first flow line.

24. (Original) A method according to claim 23, wherein an allowable range for each of the desired ratios of flow is between about 1 and about 10.

25. (Original) A method according to claim 16, wherein mass flows are measured using thermally-based flow meters.

26. (Canceled)

27. (Currently amended) A method according to claim 16, further comprising measuring pressure in one of (a) the inlet and (b) the secondary flow lines.

28. (Original) A method according to claim 27, wherein pressure in the inlet is measured.

29. (Canceled)

30. (Canceled)

31. (Currently amended) A system according to claim 1, wherein the signal indicative of the desired flow to at least one of the valves ~~comprises~~ corresponds to an orifice setting of the valve.

32. (Original) A method according to claim 16, wherein a desired orifice setting for the flow line is calculated to produce the desired flow, and an orifice setting of the flow line is regulated to match the desired orifice setting.

33. (Currently amended) A system according to claim 31, wherein the orifice setting of the valve is maintained by regulating either current or voltage ~~through~~ supplied to a solenoid.

34. (Currently amended) A method according to claim 32, wherein an orifice setting of the flow line is regulated by regulating either current or voltage ~~through~~ supplied to a solenoid.

35. (New) A system according to claim 1, wherein the desired flow is substantially equal to $K_p(\alpha - \alpha_{sp}) + K_i\int(\alpha - \alpha_{sp})dt$, wherein K_p is a proportional gain, K_i is an integral gain, α is the actual flow ratio, and α_{sp} is the desired flow ratio.

36. (New) A system according to claim 13, wherein the controller is programmed to provide a signal indicative of the desired flow to the valve of the first flow line substantially equal to $K_{p\alpha}(\alpha - \alpha_{sp}) + K_{i\alpha}\int(\alpha - \alpha_{sp})dt$, wherein K_p is a proportional gain for ratio control, K_i is an integral gain for ratio control, α is the actual flow ratio, and α_{sp} is the desired flow ratio.

37. (New). A system according to claim 13, wherein the controller is programmed to provide a signal indicative of the desired flow to the valve of the second flow line substantially equal to $K_p(P_{in} - P_t) + K_i\int(P_{in} - P_t)dt$, wherein K_p is a proportional gain for pressure control, K_i is an integral gain for pressure control, P_{in} is the measured inlet pressure, and P_t is an operating pressure threshold.

38. (New) A method according to claim 16, wherein the desired flow is substantially equal to $K_p(\alpha - \alpha_{sp}) + K_i\int(\alpha - \alpha_{sp})dt$, wherein K_p is a proportional gain, K_i is an integral gain, α is the actual flow ratio, and α_{sp} is the desired flow ratio.

39. (New) A method according to claim 28, wherein the desired flow in one of the flow lines is substantially equal to $K_{p\alpha}(\alpha - \alpha_{sp}) + K_{i\alpha}\int(\alpha - \alpha_{sp})dt$, wherein K_p is a proportional gain for ratio control, K_i is an integral gain for ratio control, α is the actual flow ratio, and α_{sp} is the desired flow ratio.

40. (New) A method according to claim 28, wherein the desired flow in one of the flow lines is substantially equal to $K_p(P_{in} - P_t) + K_i\int(P_{in} - P_t)dt$, wherein K_p is a proportional gain for pressure control, K_i is an integral gain for pressure control, P_{in} is the measured inlet pressure, and P_t is an operating pressure threshold.

41. (New) A system for dividing a single mass flow provided at a system inlet into two or more secondary flows through two or more secondary flow lines in accordance with a desired ratio, comprising:

a plurality of secondary flow lines, each of the secondary flow lines including:

(i) a flow meter for providing a flow signal as a function of the actual flow though the secondary flow line, and

(ii) a control valve responsive to a control signal for controlling the flow through the secondary flow line; and

a controller configured and arranged so as to:

(a) receive a ratio setting input representing the desired flow ratio and the flow signal from each of the flow meters,

(b) provide the control signal to each of the control valves,

(c) calculate an actual ratio of flow through the secondary flow lines based upon the actual flow through at least one of the secondary flow lines, wherein said calculation is made without reference to the total flow through the system inlet, nor the sum total of the secondary flows through the secondary flow lines, and

(d) adjust one or more of the control signals applied to one or more of the control valves as a function of the difference between the actual ratio and desired ratio

42. (New) A system according to claim 41, wherein the flow meters are thermal-based.

43. (New) A system according to claim 41, further comprising a pressure sensor measuring pressure in one of (a) the inlet and the (b) secondary flow lines, and connected to the controller to provide the pressure measurement to the controller.

44. (New) A method of dividing a single mass flow provided at a system inlet into two or more secondary flows through two or more secondary flow lines in accordance with a desired ratio, the system comprising: (A) a plurality of secondary flow lines, each of the secondary flow lines including (i) a flow meter for providing a flow signal as a function of the actual flow though the secondary flow line, and (ii) a control valve responsive to a control signal for controlling the flow through the secondary flow line, and a controller, the method comprising:

(a) receiving a ratio setting input representing the desired flow ratio and the flow signal from each of the flow meters,

(b) providing the control signal to each of the control valves,

(c)calculating an actual ratio of flow through the secondary flow lines based upon the actual flow through at least one of the secondary flow lines, wherein said calculation is made without

reference to the total flow through the system inlet, nor the sum total of the secondary flows through the secondary flow lines, and

(d) adjusting one or more of the control signals applied to one or more of the control valves as a function of the difference between the actual ratio and desired ratio.

45. (New) A method according to claim 44, further comprising:

measuring pressure in one of (a) the inlet and the (b) secondary flow lines, and

providing a signal representing such measured pressure to the controller.